

Switching-Type Fuzzy Controller Design

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Abstract

This paper propose a switching-type fuzzy controller to obtain a satisfactory performance (fast rise time, small overshoot and small steady state error) in the step response by constructing some specific scaling factors in five control regions of system. We provide a method to select suitable scaling factors of the fuzzy controller in each region. It is shown by simulation that the proposed scheme has the ability to improve the transient and steady state performance of the controlled system simultaneously. The simulation also shows that this scheme can be used to curb the effect of load disturbance in the control process.

切 換 式 模 糊 控 制 器 之 設 計

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摘要

本論文在具有良好專家控制規則訂定的前題下，提出一種具有切換能力的模糊控制器，藉著本篇架構出來的不同切換區域，此模糊控制器能在不同目標區域中，切換到適當的輸入輸出比例因數(Scaling factors)值，使系統達到滿意的響應，即小的超越量(overshoot)，小的穩態誤差(steady state error)，與快速的上升時間(rise time)。由程式模擬結果顯示，我們所提出的這種控制器架構，除了具有同時改善暫態與穩態響應的能力，此種控制器架構也能消除外界突然來的雜訊干擾或負載變動。